Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
The Development of Operational, Technical, and	)	
Spectrum Requirements for Meeting Federal, State	)	WT Docket No. 96-86
and Local Public Safety Agency Communications	)	
Requirements Through the Year 2010	)	

To: The Commission

COMMENTS OF ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS-INTERNATIONAL, INC. (APCO)

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SUMMARY

APCO supports the findings and recommendations of the Public Safety Wireless Advisory Committee (PSWAC), and urges the Commission to move quickly to implement those findings. Now is the time for the Commission to address the radio spectrum requirements of public safety agencies throughout the country. The PSWAC reports fully document the spectrum shortages facing public safety agencies, and propose specific frequency bands for reallocation. In particular, the Commission should make UHF television channels 60-69 available for reallocation for other services, and allocate a significant portion of that spectrum for immediate public safety use.

APCO generally supports the public safety and interoperability definitions contained in the PSWAC report. Implementing interoperability will require additional spectrum allocations in the VHF and UHF bands. These are more than interim steps, as it is highly unlikely that all public safety agencies will ever be able to operate in a single frequency band.

The Commission appears in its notice to have overstated the potential role of commercial services in meeting future public safety needs. Cellular and pagers are already being used for administrative, non-mission critical, public safety communications. Such use will continue and no doubt expand as new commercial services and products are offered. However, as documented in the PSWAC report, the vast majority of public safety communications are of a mission-critical nature and cannot be provided through commercial services.

Funding for public safety implementation of new spectrum allocations will be a difficult, but not insurmountable problem. Based on prior experience, state and local governments will find ways to purchase radio equipment which is critical for the protection of life and property. Auction revenue from non-public safety bands may also be an appropriate source of funding.

The Commission should improve the administration of all spectrum allocations, including public safety. However, the Commission should not simply delegate to frequency coordinators its obligation to maintain license databases. The basic approach of pre-licensing frequency coordination should be retained.

Voluntary, user-driven, interoperability standards efforts such as Project 25 promote competition in the public safety equipment market. Such standards allow agencies to select equipment from multiple vendors without sacrificing equipment compatibility or interoperability with other jurisdictions. Project 25 has succeeded as there are now multiple vendors developing and offering fully interoperability equipment.

APCO does not believe that it is necessary or desirable for the Commission to establish specific guidelines for standards-setting entities, especially in the absence of Commission intent to adopt or give official recognition to the standard in question. If and when the Commission has a standard before it for consideration, it can then examine whether that standard was adopted through a fair and open process.

TABLE OF CONTENTS

PAGE

Before the
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In the Matter of	)	
	)	
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To: The Commission

COMMENTS OF APCO

The Association of Public-Safety Communications Officials-International, Inc. ("APCO") hereby submits the following comments in response to the Commission's Notice of Proposed Rulemaking ("Notice") in the above-captioned proceeding, FCC 96-155 (released April 10, 1996).

APCO, founded in 1935, is the nation's oldest and largest public safety communications organization, with over 12,000 members involved in all aspects of the management and operation of police, fire, emergency medical, forestry conservation, highway maintenance, local government, emergency management, and other public safety communications facilities. APCO is the FCC's certified frequency coordinator for approximately 80% of public safety land mobile frequencies, including the Part 90 Police Radio Service, Local Government Radio Service, and 800 MHz Public Safety channels.

Most of the issues raised in the Commission's Notice are addressed in the recent Final Report and subcommittee reports of the Public Safety Wireless Advisory Committee

("PSWAC"). Scores of APCO members who work for federal, state and local government public safety agencies were very active participants in all stages of the PSWAC proceedings. A task force of APCO members, led by current APCO President Marilyn Ward, spent hundreds of hours making significant contributions to the PSWAC subcommittees and to the final PSWAC documents.

APCO has long urged the Commission to address the serious spectrum shortages facing public safety agencies. Without new spectrum, public safety agencies will be unable to obtain interference-free channels for basic emergency communications and will be thwarted in their attempts to implement new communications networks, systems and tools that will enhance their ability to protect the safety of life and property. New spectrum allocations are necessary for agencies to provide critical interoperability between public safety agencies that must communicate on a daily basis to coordinate emergency response activities.

Congress has repeatedly expressed concern as to whether the FCC is adequately addressing these public safety spectrum requirements, a concern which is rooted in the core purpose of the Communications Act of 1934 to promote "the safety of life and property through the use of wire and radio communications."[1] For example, in 1983 Congress mandated that the Commission "establish a plan which adequately ensures that the needs of State and local public safety authorities would be taken into account in making allocations of the electromagnetic spectrum."[2] In response, the Commission's Private Radio Bureau conducted a detailed study estimating that between 12.5 MHz and 44.5 MHz of additional public safety spectrum would be

[1] 47 U.S.C. §151.

[2] FCC Authorization Act of 1983, H.R. Report No. 356, 98th Cong., 1st Sess. 27 (1983).

needed in the 21 largest metropolitan areas by the year 2000.[3] Yet, the only Commission action that resulted from that study was to allocate just 6 MHz for public safety in 1986.[4] No other significant public safety spectrum has been allocated since that time. Thus, Congress stepped in again in 1993, and ordered the Commission to study current and future public safety spectrum requirements through the year 2010, and establish a plan for meeting those requirements.[5] This time, even the Commission's study and plan was inadequate,[6] and was widely criticized not only by APCO,[7] but also by key Members of Congress.[8]

More recently, the Commission appears to have recognized the importance of addressing public safety needs, as demonstrated by its commitment of substantial time and resources to PSWAC, to this proceeding, and to other related matters. APCO welcomes and applauds this new effort, and pledges to continue to work closely with the Commission to assist it in fulfilling its obligation to allocate and manage the spectrum in a manner that protects the safety of life and property. However, the time for studies is over. Now is the time for the Commission to act.

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[3] FCC Private Radio Bureau "Future Public Safety Telecommunications Requirements," PR Docket No. 84-232, 49 Fed Reg. 9754 (Mar. 15, 1984).

[4] Report and Order in Gen. Docket No. 84-123, 32 FCC Rcd 1825 (1986).

[5] 47 U.S.C. §309(j)(10)(B)(iv).

[6] Report and Plan, Meeting State and Local Government Public Safety Agency Spectrum Needs Through the Year 2010 (February 9, 1995).

[7] See Response of the Association of Public-Safety Communications Officials-International, Inc. to FCC Report and Plan (submitted to FCC and Members of Congress on Feb. 23, 1995).

[8] On March 22, 1995, during a hearing on FCC and NTIA appropriations, Subcommittee Chairman Harold Rogers (R-KY), told FCC Chairman Reed Hundt that "[our] review, as well as the review by the Association of Public Safety Communications Officials, reveals [the Report and Plan] is a superficial and inadequate study of public safety spectrum needs." Hearings Before the House Committee on Appropriations, Subcommittee on the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies, 104th Cong., 1st Sess., Part 6, Telecommunications Issues, at 410 (March 22, 1995).

The PSWAC Final Report substantiates the significant spectrum requirements of public safety agencies. The Final Report concludes that public safety agencies will need 2.5 MHz immediately for interoperability, at least 25 MHz of new spectrum within the next 5 years, and an additional 70 MHz of spectrum by 2010. The Final Report also recommends specific allocations of spectrum that appear to be available for possible reallocation. APCO strongly supports those recommendations. In particular, APCO believes that the Commission now has before it a critical opportunity to take immediate action to help the nation's public safety agencies meet some of their spectrum requirements. The pending Digital Television ("DTV") proceeding, MM Docket 87-268, includes a proposed channel allotment that could lead to the immediate reallocation of a portion of the spectrum now used for UHF television channels 60-69. That spectrum is adjacent to the 800 MHz mobile radio bands already used by many public safety agencies, and would therefore facilitate the development of equipment that would be interoperable with current public safety operations. The spectrum could be used to implement new public safety communications technologies and to provide spectrum relief in congested metropolitan areas.

As discussed below, APCO also supports the other spectrum recommendations contained in the PSWAC Final Report. The Commission must move quickly and deliberately to implement these recommendations. Unless action is taken soon, all available spectrum will be put on the auction block, leaving public safety agencies without the spectrum they need for their critical operations now and in the future.

The PSWAC Final Report and the five PSWAC subcommittee reports fully and accurately address many of the issues raised in the Commission's Notice of Proposed

Rulemaking. In particular, the Commission must not overlook the five subcommittee reports which contain much of the "meat" of the PSWAC effort. Rather than replicate the extensive discussion contained in those PSWAC documents, APCO's comments below will focus only those issues in the Notice that require further elaboration or clarification.

A. INTEROPERABILITY ISSUES

1. Public Safety Definitions

APCO supports the Interoperability definitions described in the PSWAC Final Report and the Interoperability Subcommittee Report. The definitions represent a departure from the classifications which had "listed" types of services in favor of a broad classification of public safety entities. The definition of "Public Safety" focuses not only on the protection of life and property using the traditional "emergency first responder" definition (that typically only includes emergency medical, fire, and law enforcement) but also on other vital governmental services which protect and service the public welfare. APCO fully endorses the concept expressed in paragraph 25 of the Notice that the current classification of certain types of service as "public safety" may have had the unintended effect of limiting the ability of public entities to fulfill their respective missions. Thus, the expressed intent to include the broadest array of governmental entities within the concept of public safety is sound. Indeed, how state, local and regional government address public safety and delivery of important governmental services differs from region to region. For that reason, it needs to be made clear that the purpose of the definitions is to be broad enough to encompass these variations among governmental services providers.

APCO is concerned, however, that, after proposing to adopt the PSWAC definitions, the Commission in paragraph 32 of the Notice, in the example discussing the San Diego RCS, defines the "California Department of Transportation and those county agencies responsible for providing citizens with services other than law enforcement, fire, and disaster preparedness" as public service agencies. The PSWAC definitions were clearly intended to place such governmental organizations as these within the "Public Safety Provider" category. The "Public Service" category was specifically intended to cover such organizations as private railroads and utilities which have incident-specific needs to interoperate with public safety organizations. PSWAC proposed that public safety spectrum would be available to public service entities only for purposes of interoperability with public safety agencies on an incident-specific basis.

The definitions need to be interpreted in accordance with the spirit of the PSWAC process, to be inclusive of all governmental functions. Although some governmental entities may have responsibilities that do not fall into the emergency first responder concept of public safety, they nevertheless reflect the myriad vital functions which service the public welfare. In addition, the definitions move beyond strict governmental services by providing for certain non-governmental entities which may be authorized by the appropriate governmental entity to perform a public safety function as either a "Public Safety Services Provider" or "Public Safety Support Provider." APCO endorses this concept provided that the licensee of the frequencies remains the governmental body. The definitions also recognize the important concept that there are non-governmental entities categorized as "Public Services" which may need interoperability with public safety licensees on an incident-by-incident basis.

APCO further believes that the adoption of the proposed definitions and the intent to include all vital governmental services will ultimately improve the development of public safety communications and technology, since it will tend to promote a unified approach to common communications issues. Federal, State, and local governmental entities will be looking to use the most efficient method of systems implementation to handle multi-disciplinary uses in an area rather than focusing on a narrower approach designed to meet only a particular user's service needs. This more unified approach tends to promote trunking-type systems and other shared resources as they are the most effective way to achieve multi-service sharing of spectrum allocations.

2. Interoperability Definitions

APCO agrees with the definitions of interoperability as contained in the PSWAC Interoperability Subcommittee Report, at pp 1-2. As noted, the ability of an agency and its units to intercommunicate across regional and political boundaries in the management of public safety incidents is becoming more and more critical. Most public safety incidents require multiple responses from differing agencies to effect good incident management.

3. Interoperability Needs

APCO agrees with the PAWAC finding which divides interoperability into the three categories of day-to-day, mutual aid, and task force. APCO believes that it is important to note that the number of lives impacted by day-to-day interoperability requirements across the country far outnumber those impacted by the two other types of interoperability. The PSWAC

definitions provide a method to clearly identify interoperability needs. For example, mutual aid incidents, while often planned for in concept, are normally unannounced and unplanned in occurrence. Communications coverage for command/control of mutual aid incidents is usually required through the impacted area. In contrast, task force events (such as drug interdiction operations) generally are characterized by involvement of multiple levels of government (federal/state/local) and include much advanced detailed planning; the cast of involved parties is generally carefully controlled. While task force coverage may be required over large areas (as suspects move, for example), communications is generally of a close-in nature. APCO is concerned that, in paragraph 30 of the Notice, the Commission appears to have strayed from these PSWAC definitions, confusing the mutual aid and task force definitions. APCO urges the Commission to use the PSWAC definitions as the basis for any future reference to interoperability needs.

4. Interoperability Options

The PSWAC Final Report and Interoperability Subcommittee Report addresses most of the issues in the section. However, APCO will briefly comment upon the interoperability options identified in the Notice.

The first option, relocating all public safety communications to a single band, has some theoretical advantages. However, public safety agencies have a wide variety of spectrum requirements, which are unlikely to be met in the same frequency band. For example, some wide area operations need to be on VHF bands to provide adequate coverage; and 800 MHz frequencies are not appropriate for cost-effective use in mountainous and/or heavily wooded

areas. In any event, APCO does not believe that adequate spectrum is likely to be available in the foreseeable future to accommodate all public safety agencies within one band. Therefore, multiple frequency bands are likely to still be required for many years, and probably indefinitely.

In paragraph 38, the Commission seeks comment on various means of achieving interoperability. Public safety quality dual-band radios are available today from at least one manufacturer, supporting communications in the 150-174 and 450-470 MHz bands. While the FCC could require operation on an interoperability band through its type-acceptance process, it does not mean that dual-band equipment can be built or would be affordable, particularly if one of the bands is 800 MHz. Manufacturers have indicated that one of the major problems is dual-band antenna design. Today's dual-band antennas, particularly those designed for portable equipment, tend to be inefficient, leading to the need for higher powered transmitters and the potential need for increased infrastructure to overcome these inefficiencies.

The FCC-proposed "inexpensive software programming to modify much of public safety's current equipment" would be possible only if the interoperability frequencies fell within one of the existing bands and on existing channel centers, as most of today's equipment is not even capable of reaching the newly "refarmed" channels. That implies that these interoperability channels would have to come from existing inventories with the resulting requirement to relocate large numbers of incumbents. A modification on the final proposal for a separate dedicated radio is the logical answer and, after much consideration, the solution adopted by the PSWAC Interoperability Subcommittee.

The Notice also discusses cross-band repeaters and gateways. APCO notes that a gateway in theory does provide limited protocol conversion (the Technology Subcommittee

agreed, however, that it would generally not be possible to gateway systems using different digital vocoders); however, if the radios operate indifferent bands, cross-band repeaters will still be needed. Cross-band repeaters and gateways are, nonetheless, considered to be short-term solutions, provided that infrastructure is in place to support their implementation.

In paragraph 40 of the Notice, the Commission requests comments on the number of interoperability channels and where they should be located. The FCC's conclusions with respect to channel counts are based on early PSWAC discussions. Ten pairs were found to be woefully inadequate for even the moderate incidents encountered regularly across the country. The PSWAC Interoperability Subcommittee examined a number of incidents and found the following number of channels would meet foreseeable future needs.

- Establish five (5) repeater pairs in each of the VHF bands (40-50 MHz and 150-174 MHz) and in the UHF band (460-500 MHz).
- Establish a new interoperability band in spectrum below 500 MHz, designating 80 simplex channels and 40 repeater pairs exclusively for shared interoperability according to a priority system, using 12.5 kHz channels. Band plans would be developed at the national level, with the possibility of regional input with respect to operational procedures. Additionally, designate four (4) 125 kHz pairs for wideband data and video (2 each); these 125 kHz channels should support 384 kbps data transport at 3 bps/Hz. This proposal uses a total of 2.5 MHz of spectrum. It is critical that this spectrum be dedicated solely to interoperability throughout the United States.

In paragraph 41 of the Notice, the Commission seeks comments on a common mode and frequency band. APCO supports this proposal. Key to the success of any interoperability band

is developing standardized channel nomenclature which must be mandated in the Rules. We also note that mandating dual-band equipment may be premature. In particular, it will be difficult or impossible to provide dual-band equipment involving the 800 MHz band.

In paragraph 42 of the Notice, the Commission seeks comment on type-acceptance requirements for public safety radios to be capable of operating on mutual aid channels. APCO supports the PSWAC Interoperability Subcommittee recommendation adopted by the PSWAC Steering Committee which defines an analog baseline with specific timetables for migrating to narrowband interoperability channels. APCO also strongly endorses the PSWAC recommendation that in the future these standards must address a digital baseline.

Interoperability issues as outlined in the PSWAC report cover a wide range of technical components necessary for achieving results. However, there are also organizational, political, and budgetary issues that agencies must overcome in order to be involved in the process of consolidation and other moves affecting interoperability. Agencies which have combined to share spectrum resources have gone through an extensive process in order to come to an agreement on the technology and spectrum they use. As new applications arise, there will need to be time to sell the idea and obtain the funding to accomplish the desired interoperability. This is true whether it is the consolidation of resources or the addition of new technology and spectrum resources. The Commission needs to know that if there were interoperability spectrum available at this moment, it would take time for the user agencies to gear up the resources to implement them (both financially and politically).

B. OPERATIONAL ISSUES

1. Service Features

This topic is covered in detail in the PSWAC Final Report and Operational Subcommittee Report. APCO agrees with PSWAC that many of the service features will include technologies that require additional spectrum. These technologies will include some of the following: encryption/security, mobile data both in vehicle and portable, broadband video, records access across multiple databases, voice recognition, transmission of photographs, fingerprint identification and database identification from field units, report generation from the field, data access to plans and hazardous material, nationwide data access for crime, drugs, NCIC and interagency data, drivers license scan capability with automatic records update into drivers licenses, court records, and insurance databases. There are a host of other control functions such as sign control, traffic lights, mass transportation controls, and correctional facility applications which will utilize wireless connections. If the spectrum were available today, many of these would be in operation already and would be saving lives.

2. System Requirements

In paragraph 55, the Commission requests comments as to "whether public safety licensees, as a general matter, should be required to utilize joint networks for their public safety communications." APCO believes that there are distinct advantages to joint networks, and many APCO members have successfully implemented such systems. The driving force is often the desire to share and reduce costs, and to maximize spectrum utilization. The Commission can and should encourage the development of joint operations, possibly through incentives such as

priority licensing. However, local agencies must not be penalized for failing to combine into joint networks. Local agencies must maintain the freedom to operate separately if they deem it necessary for their operations and local needs. Combining systems creates significant operational and jurisdictional (i.e., political) issues which can sometime interfere with the underlying goal of providing public safety services. In many cases, the most prudent approach, which may also be the most spectrum efficient approach, is to maintain separate systems.

C. TECHNOLOGY ISSUES

The Commission identifies four (4) types of technologies in the Notice (TDMA, CDMA, FDMA and ACSSB) and seeks comments as to each technology's application to public safety. The Commission appears to be particularly concerned with the relative efficiencies offered by each technology. However, it is important to note that spectrum efficiency cannot be measured only by the amount of information that can be transmitted in a given portion of spectrum in a given time. Equally important for public safety purposes is the requirement for clear spectrum in times of emergency and the ability to build systems designed to perform a specific purpose. For example, a police or fire channel which is idle for significant periods of time awaiting an emergency dispatch cannot be considered "wasted." With this in mind, APCO offers the following observations regarding each of the technologies identified by the Commission in the Notice.

TDMA; increases the number of communications channels in a given segment of spectrum by dividing it into time slots. TDMA requires that all signals flow through a central device to

synchronize the time slots. This prevents direct unit-to-unit communications when out of range of supporting infrastructure; such direct unit-to-unit communications are critical for most public safety mobile systems. Although TDMA can be very efficient in the event the extra links (time slots) created are required for the same system or another system with identical coverage requirements, if the particular need requires a different geographic area of operation, there is no resultant gain in spectrum efficiency.

CDMA; utilizing spread spectrum modulation techniques and coding schemes appears to offer significant promise for spectrum efficiency, provided there are wide blocks of spectrum available for use. Any attempt to overlay this technique in the spectrum presently allocated for public safety use creates many problems, however. As channel loading is increased, the noise floor will rise. There has not been sufficient time or field testing to completely evaluate the effectiveness of this technique or its applications to public safety.

FDMA; as stated in the Notice, will offer 2 to 1 and eventually 4 to 1 advantages over present spectrum use. It permits unit-to-unit communications without infrastructure, which is very critical for public safety operation and interoperation. However, absent an FCC mandate, there is little incentive for any single licensee to convert to narrower channels, as the vacated channels are generally of more value to another agency. As a positive aspect, the use of FDMA does result in some immediate opportunity to utilize vacated channel space, if and when such should become available.

Linear Modulation (ACSSB) and similar technologies use a type of amplitude modulation. Some of these techniques appear to offer a significant gain in spectrum efficiency. However, they do have certain drawbacks. For example, some methods require multiple antennas for mobile use and linear amplifiers. Linear or linearized amplifiers will also lead to higher costs and higher power consumption.

Thus, each particular technology has its own advantages and disadvantages. In any given application, some will fit better than others. The problem that arises when considering multiple techniques is that they are generally incompatible with each other. Without common technology, vital interoperability between agencies will be seriously impeded. Equally important is a graceful migration path from existing technologies to the new systems. In the absence of a graceful migration path, entire systems must be replaced at a single time. Most public safety agencies will require multiple budget cycles and procurement to replace the existing systems. The local political climate and available funding will also help or hinder how quickly this takes place.

Recognition of this problem led to the creation of APCO Project 25, which is further discussed below in Section F and in the separate comments being filed by the Project 25 Steering Committee. The goals of the project are standardization, interoperability, graceful migration and economy through competitive multi-source procurement. Project 25 selected FDMA as the technology of choice, even though it was recognized that in some instances and applications other technology might provide more channels in a given portion of spectrum. However, overall, more public safety agencies would benefit from an FDMA standard than any other currently

available and proven technology. This does not imply that there cannot be standardization and use of other techniques, provided the above goals of migration and interoperability are met. The rapid advance of technology and future discoveries could conceivably lead to several of the above technologies being encompassed in a single unit. However, Project 25 concluded that we must meet today's needs with available technology rather than bet on what may come.

The are many methods of achieving spectrum efficiency. As a frequency coordinator, APCO already expends great effort in attempting to make recommendations that will maximize the use and reuse of limited public safety spectrum. Limitations on power, antenna design and attention to system parameters are necessary to provide applicants with systems which will serve their needs while protecting other users. This process will continue, and will become increasingly more important (though more difficult), as channel spacings are reduced through spectrum refarming.

The Commission should also recognize that as channel spacings are narrowed, regardless of the technique employed, the cost of equipment rises. Frequency stability must be improved, and both transmitter and receiver design will require more stringent parameters. Antennas may become more complex, and as powers are lowered, more sites are required to provide the same radio coverage within an agency's area of jurisdiction. There is little opportunity to share or reuse channels other than by decreasing the effective channel spacing at resultant higher cost. Budgeting for these costs is always a major consideration for federal, state and local government.

In its discussion of trunking (para. 65), the Commission assumes a 2.7 efficiency advantage for trunked systems. However, that assumption may be far from correct. While trunking can, and does, provide many advantages and better spectrum utilization in many cases,

it cannot be considered a panacea. Efficiency is dependent upon the size of the system, the coverage required, the mix of users and the design of the system. It is not a constant factor and tends to increase as system size is increased. For small applications, conventional systems may offer as great, or even greater efficiency than trunked systems. Conversely, trunking a large system with a mix of services which have different busy hours of operation can offer very significant improvement in spectrum efficiency. For instance, if the system covers both urban and rural areas, simulcast of all channels severely impacts the potential for reuse and results in the rural areas of the system having a surplus of spectrum. Trunking is only one of several tools which can be used to perform system efficiencies. If it fits the application, it should certainly be used. However, rather than any attempt to mandate trunking, the decision should be left to users.

The concept of developing large trunked systems with a variety of public safety services and multiple agencies is sound. This too, must be accomplished through permissive means and incentives, rather than mandates. Individual agencies, and even the various public safety services, tend to be provincial, and resist mandated efforts to force consolidation. Properly designed and operated systems, both trunked and conventional, can offer greatly improved service and interoperability, as well as reduced costs. These factors, combined with dedicated spectrum, must be relied upon to encourage, but not to force consolidated systems.

The present "Refarming" efforts for existing spectrum offer little in the way of short term alleviation of severe overcrowding. That proceeding is not yet complete, and is relying on type acceptance of equipment to lead to utilization of the narrower channel spacing. The process should be expedited to some degree by specifying dates certain by which conversion to the narrower channels would be required under penalty of reverting the license to secondary status.

Such a process would expedite conversion in urban areas, and in other areas where the shortage of channels is the most acute. It would also allow the systems in some rural and lightly loaded areas to amortize existing equipment without jeopardizing their operation, based on the dates set.

In paragraph 68 of the Notice, the Commission asks if it should consider adoption of receiver and transmitter standards. The Commission has historically refused to establish such standards, which has led to innumerable complaints of interference that were the result of inadequate equipment performance. APCO believes that as public safety users move towards to new and complex technologies, with the possibility of a mix of several types of access methods and channel spacing, it becomes imperative to set equipment standards which will minimize interference and promote maximum utilization of the spectrum. The use of computer generated models, such as that being developed through TIA Committee TR 8.8., provides for the input of these various parameters. APCO therefore recommends that the Commission require receiver as well as transmitter specifications for new bands and new assignments. This must also include maintaining a database of receiver parameters, squelch tones and digital codes, which will assist in interference avoidance. These parameters should be included as part of the license.

D. SPECTRUM ALLOCATIONS

1. Overview

The PSWAC Spectrum Requirements Subcommittee Report includes a detailed quantitative evaluation of the public safety spectrum needs. APCO supports the recommendations of that Report, and urges that the FCC move quickly to satisfy those requirements for both the short term, i.e., 2.5 MHz immediately and 25 MHz within the next 5

years, and in the long term, i.e., an additional 70 MHz over the next 15 years.[9] These projections were based on detailed models reflecting advances in technology and the expectation that some portion of public safety needs could be met through commercial services. APCO recognizes that allocating more spectrum for public safety will not be an easy task as there is little desirable spectrum not already allocated for other uses. Some other services will need to see a reduction in their total spectrum allocation in order to meet the public safety requirements identified by PSWAC. This problem can be alleviated to some degree if the Commission decreases, rather than increases, the present use of spectrum targeted for possible future reallocation to public safety.

PSWAC attempted to target those frequency bands which could be reallocated with the least disruption to existing licensees. This is important, as public safety agencies generally lack the resources to pay for the relocation of incumbents to other bands. APCO also recognizes that there is considerable pressure to raise revenue from the auction of radio spectrum, posing additional hurdles for the Commission in its efforts to meet public safety requirements. Nevertheless, the Commission must not lose sight of its most critical role — to allocate spectrum in a manner that protects the safety of life and property.

Finally, in addition to allocating new spectrum for all public safety agencies, the Commission must also adopt a more open approach towards requests from individual public safety agencies for rule waivers to permit their use of non-public safety spectrum on a case-by-case basis. The Commission indicated just last year that such waivers would be part of its

[9] However, APCO does not support the PSWAC recommendations that "refarmed" non-public safety land mobile channels below 512 MHz be reallocated for public safety. Those channels would be of minimal use.

overall "plan" to meet public safety needs. [10] The waiver process can be a particularly effective tool in fulfilling immediate needs which cannot await realization of the longer term programs to increase public safety spectrum under consideration in this proceeding. Yet, recent cases suggest that the Commission has may have already abandoned this important tool.[11]

2. Spectrum Allocation Options

The Commission makes a tentative conclusion that allocating additional spectrum is not likely to satisfy current and future public safety needs. To a degree, that is true, as needs are likely to expand faster than spectrum can reasonably be expected to become available. However, the PSWAC Final Report makes it clear that allocating substantial additional spectrum for public safety is absolutely critical. Existing allocations can and are being used more efficiently and, in some instances, certain non-mission critical communications can be accommodated by future commercial systems. However, as noted by PSWAC, those efforts alone will fall far short of meeting public safety requirements. There must be new spectrum allocations.

The most critical immediate opportunity to allocate additional spectrum for public safety is in the Commission's Digital Television (DTV) proceeding (MM Docket 87-268), where the Commission has proposed the reallocation of spectrum now occupied by UHF Channels 60-69. UHF Channels 60-69 occupy spectrum immediately adjacent to the 800 MHz frequency bands

[10] Report and Plan, Meeting State and Local Government Public Safety Agency Spectrum Needs Through the Year 2010 (February 9, 1995) at 43.

[11] See Memorandum Opinion and Order on Reconsideration in the Matter of South Bay Regional Public Communications Authority Application File No. 415919 (released Apr. 24, 1996); Memorandum Opinion and Order in the Matter of Applications of State of New Hampshire (released May 3, 1996).

that many public safety agencies already use for trunked and other spectrum efficient radio systems. Therefore, APCO strongly supports such a reallocation, provided that a significant portion of that spectrum is reallocated specifically for public safety use. The Commission should also take steps to maximize the extent to which those channels will actually be available to meet short-term public safety spectrum needs, especially in and near metropolitan areas.

In addition to UHF channels 60-69, the Commission must also provide additional spectrum in the VHF/UHF bands where most current public safety systems operate. In particular, as part of the DTV channel allotment, APCO urges that a portion of the spectrum now occupied by VHF television channels 7-9 (174-192 MHz) not be included in the DTV "core spectrum" and, therefore, be made available at the end of the transition period for reallocation to public safety. This VHF spectrum is adjacent to current public safety land mobile spectrum used by federal, state, and local agencies, and is critical to the development of wide-area interoperable communications. Many state-wide communications networks need to operate in the VHF band to provide sufficient coverage in a cost-effective manner.

The PSWAC Final Report also recommended that consideration be given to reallocating to public safety the 380-400 MHz band now allocated to the Department of Defense (DOD). This band had been designated for NATO operations, though European countries have recently allowed civilian public safety use of those frequencies. While DOD has strongly opposed any release of the 380-400 MHz band, even on a shared basis, APCO continues to believe that the band should remain under consideration for public safety use, and urges NTIA and the FCC to explore at least a partial reallocation of the band as soon as possible.